City of Lafayette Staff Report

For: City Council

By: Ann Merideth, Community Development Director

Date Written: March 3, 2008

Meeting Date: March 10, 2008

Subject: Status report on the City's Environmental Strategy

Summary

The City adopted its Environmental Strategy in November 2006. Since then, staff, Environmental Strategy Task Force, and other citizen volunteers have been implementing this sustainability policy for the community. The purpose of this agenda item is to provide on update on the Strategy's implementation to date as well as describing next steps for this important City program, including the City's participation in the ICLEI program for Contra Costa and actions on Task Force organization, sustainability practices for City Offices, and options for the development of a green building program.

Status of the Environmental Strategy

Task Force

The City Council formally established the Task Force as a review and advisory body during the preparation of the Environmental Strategy. The Task Force grew out of an informal group of Acalanes students and faculty, City representatives, and interested residents that were meeting to develop a sustainability program for the community. The role of the Task Force was to take the program concept developed by the original group, seek the input of all the Commissions, committees, organizations, and groups in the community, and develop a sustainability policy for the City and community. Task Force membership represented the following constituencies:

- City Council
- Planning Commission
- Circulation Commission
- Parks, Trails & Recreation Commission
- Bicycle & Pedestrian Advisory Commission
- Lafayette School District Governing Board
- Acalanes Faculty
- Chamber of Commerce
- Lafayette Homeowners Council
- Students
- Residents

While this membership composition was invaluable during the preparation of the Strategy, it has been less effective in the implementation and fulfilling of tasks simply because of membership attrition. People are

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busy. To date, representatives from the School District, Parks, Trail & Recreation Commission, and students have dropped off the Task Force. Most meetings have only three to four Task Force members and three to four residents who are very interested in sustainability. While a regular meeting date has been established as the second Monday of the month before the City Council meetings, this date is sometimes compromised by other pre-Council meetings. Having the meeting at 5:00 pm can also be difficult.

Tasks

	Task	Status
	2007	
1	Establish baseline levels for current residential water and energy use and solid waste generation, and water quality in creeks, and establish targets and milestones.	Staff is working within ICLEI's program for Contra Costa cities and County to produce emission baselines for 2005 for energy use, waste generation, and vehicles. Water use and water quality will be developed later. See discussion below about ICLEI's program.
2	Establish baseline level for the community's use of public transportation, and establish targets and milestones for increasing this level.	This baseline will be developed later after the ICLEI program is completed.
3	Investigate and make recommendations to the City Council regarding the programs of ICLEI – Local Governments for Sustainability, including those within Contra Costa County.	The City Council approved membership in ICLEI in July 2007, and we are participating in its Contra Costa program.
4	Investigate and make recommendations to the City Council regarding the U.S. Mayors Climate Protection Agreement.	The City Council authorized the Mayor in November 2007 to endorse the Agreement. We are now listed on the US Mayors website: http://www.usmayors.org/climateprotection/map.asp
5	Assist City staff to initiate the development of City guidelines and incentives for sustainable building practices and a green building ordinance.	The Task Force has discussed a green building program, and they are very supportive. More discussion is below.
6	Organize an annual Earth Week and associated Earth Day Event to enhance environmental awareness and allow residents to network and learn about environmental services and organizations.	A Task Force sub-committee in conjunction with the Chamber hosted the first Earth Day event in 2006. The sub-committee worked with Sustainable Lafayette to host the second event in 2007. The same group is to developing the plans for the 2008 event, which will be held at Stanley Middle School on April 18.
7	Investigate and make recommendations to the City Council regarding the development and implementation of sustainable procurement practices for City supplies and materials.	A memorandum describing suggested sustainability practices for City Offices is attached to this staff report.
8	Encourage businesses to recycle, reduce packaging, close doors when heating or air conditioning is on, and use energy efficient lighting.	The Chamber of Commerce has formed a green committee, and Task Force and Sustainable Lafayette members have expressed an interest in working with this committee on a green business program.

	Task	Status
	2008	
9	Develop and implement programs to meet established targets and milestones for residential water and energy use and solid waste generation and water quality in creeks.	Staff is participating in ICLEI's program for Contra Costa cities and County to produce emission baselines for 2005 for energy use, waste generation, and vehicles. More discussion about the status of this program is below.
10	Develop and implement a program to meet established targets and milestones to increase the community's use of public transportation.	This baseline will be developed later after the ICLEI program is completed.
11	If acted on by the City Council, begin follow-up to Council's actions on U.S. Mayors Climate Protection Agreement programs and/or ICLEI programs.	This task is being met through the ICLEI program.
12	Assist City in the completion of guidelines and incentives for sustainable building practices and the adoption of a green building ordinance.	One of the Council's adopted 2008/2009 goals is: *Develop a green building program.* More discussion is below.
	2008-2010	
13	Promote programs that encourage reuse and increase recycling among businesses, residents, community organizations, and schools and other service providers.	To be done.
14	Investigate and make recommendations to the City Council regarding the purchase of hybrid and/or other fuel-efficient vehicles for City use.	The City rarely purchases new vehicles. But the Police Chief's new car is a hybrid (the first hybrid police chief's car in California), and new Code Enforcement vehicle is fuel-efficient.
15	Through the City and/or schools, establish a local California Native Plant Garden and educate the community about drought tolerant plants and drip irrigation.	The Lafayette School District Board recently approved the construction of a garden at Springhill.
16	Publicly recognize businesses, residents, community organizations, and schools and other service providers that model environmental stewardship.	In October 2007, the City Council approved co-sponsoring with Sustainable Lafayette a Green Award program. The first awards will be presented at the April 14, 2008 City Council meeting.
17	Encourage the use of non-polluting household, work-related and garden products and Integrated Pest Management programs.	To be done.
18	Develop and provide pamphlet "Your Watershed Responsibilities as a Homeowner in Lafayette" to all homeowners.	To be done. The Creeks Committee is working on this as a project.
19	Recommend to the City Council an annual budget for watershed monitoring of pollutants.	To be done.

	Task	Status
20	Educate the public about the difference between native and potentially invasive plants, particularly near creeks.	To be done.
21	Investigate and make recommendations to the City Council regarding 25 mph electric vehicles within a certain perimeter.	To be done.
22	Investigate and make recommendation to the City Council regarding imposing limits on use of gas powered leaf blowers and encouraging the use of electric lawn mowers.	To be done.
23	Investigate and promote opportunities for Lafayette consumers to purchase local and regional organic produce, such as a local farmers' market.	To be done. This subject may also arise during the Downtown Strategy process.
24	Plan an environmental speaker series for the Senior Services Center and other groups.	To be done.
25	Have a regular space in the *Sun* for environmental information and consumer advice.	To be done.

What's Next for the Strategy?

Task Force

The current Task Force composition needs to be reorganized to be effective in implementing and evolving the Environmental Strategy. Staff has discussed this with the group that attends the Task Force meeting, and we suggest the following to increase an active membership:

- The Task Force would have 11-15 members. This number would allow current Task Force members to stay, if they wish, as well as bring on new members.
- There would be no requirement for representation of a group or organization. A dedication to sustainability and a willingness to work on volunteer projects would be the only requirements.
- Establish a regular meeting date and time that is not tied to another City meeting.

Strategy Tasks

The two major tasks for the rest of 2008 and into 2009 are developing a green building program and completing ICLEI's program for Contra Costa cities. The ICLEI program is discussed in more detail below, but this will be a job for staff to complete with review by the Task Force. Likewise, development of a draft green building program will be a staff responsibility with input from the Task Force. Due to limited resources, staff proposes to focus on these two tasks, and not undertake the smaller programs listed in the Environmental Strategy. These smaller programs are more suited to Task Force members in conjunction with the Chamber of Commerce (and its green committee) and Sustainable Lafayette.

Sustainability Practices for City Offices

A memo to the City Council regarding suggested sustainability practices is attached (Attachment 1).

ICLEI

ICLEI is attempting to standardize the work being done by cities and counties to establish greenhouse gas emission baselines and develop action plans for reducing these emissions. Alameda County and its cities were the first to go through a process together to do this work with assistance from ICLEI. Contra Costa County and its cities are now going through the process.

This work has taken on more importance since the passage of AB32 with its goal to reduce the state's greenhouse gas emissions to 2000 levels by 2010 (11% reduction), 1990 levels by 2020 (25% reduction), and 80% below 1990 levels by 2050. These reductions will be accomplished through an enforceable statewide cap on statewide emissions that will be phased in starting in 2012. To implement the cap, AB32 directs the California Air Resources Board to develop appropriate regulations and establish a mandatory reporting system to track and monitor emission levels. Additionally, AB 32 requires that the Board use the following principles to implement the cap:

- Distribute benefits and costs equitably
- Ensure that there are no direct, indirect, or cumulative increases in air pollution in local communities
- Protect entities that have reduced their emissions through actions prior to this regulatory mandate
- Allow for coordination with other states and countries

The second and third bullets are relevant to cities. There is a sense that at some point – 5 years, 10 years from now – the State will impose some level of mandatory requirements on cities to reduce emissions at the local level. This could be through a mandatory sustainability element of general plans, adopted emission reduction actions plans, and/or green building ordinances. The third bullet is important because the cities that have their general plan elements, action plans, green building ordinances, or other emission reduction programs in place before regulations take effect are in better positions. Staff will continue to monitor the implementation of AB32, and report back to Council as more information is available.

The possibility of new regulations in our future makes the ICLEI program more beneficial. The first step in the program is to establish baselines for emissions from residential, commercial, industrial, and transportation sectors for each community. (More information about the community greenhouse gas inventory methodology is in Attachment 2.) ICLEI is using the year 2005 as the baseline since consistent data from PG&E, Metropolitan Transportation Commission, Bay Area Air Quality Management District, and California Integrated Waste Management are available. (Data from 1990 are not available; the California Air Resources Board will be addressing this problem in its proposed regulations.) ICLEI gathered the data for each community from these sources, and provided them to cities' staffs at workshops in February. At these workshops, we were trained in using the ICLEI software to enter the 2005 data and calculate the 2005 greenhouse gas emissions for each community. The data and draft emission baselines for Lafayette are in Attachments 3 and 4.

The next step in the program is ICLEI will hold another set of workshops for the cities this spring to demonstrate how to establish emission reduction targets and develop action plans. Each city will have its own targets and action plan. For example, those for Pittsburg and Richmond, with their industrial base, will be different from Walnut Creek and San Ramon, with their commercial base, which will be different from Lamorinda, with our high percentage of residential uses. Our action plan will be drafted be through the ICLEI program, and then go through review by the Task Force.

Downtown Strategy – BAAQMD grant

While not identified in the Environmental Strategy, the work being done for the Downtown Strategy to address climate change will inform the action plan as it is developed and other tasks as they implemented.

The Environmental Strategy should be a dynamic document that can evolve as other City policies and programs addressing sustainability are enacted.

Green Building

Members of the Environmental Strategy Task Force have been discussing green building guidelines with members Tom Chastain and Dick Holt taking the lead in the discussions with Commissioner Chastain presenting the state-of-the art of green building programs. There was much support from the Task Force members to proceed with a program. A presentation was also made to the Planning Commission in October. In the meantime, staff has been attending workshops and researching what other Bay Area cities are doing with green building programs. This subject is fast-changing and everyday there is more information about such programs. But the discussions and research has led to some conclusions by staff:

- Most Bay Area cities have implemented or are in the process of developing green building programs.
- The Build It Green checklists are the most popular to use, and they are becoming the standard used in the Bay Area. The LEED checklist has been expensive to use and not as user-friendly. Having a consistent standard throughout the region will make green programs easier to accept by the development and construction community.
- Some cities have started out with mandatory requirements. Others are only doing voluntary programs. But a lot of cities have a hybrid approach – starting out with a voluntary guideline program and then introducing mandatory requirements in phases. This approach has two benefits. It provides a period of time for public education and for staff to get familiar with green building techniques. It also allows time to create a pool of qualified reviewers, either our staff with training or outside certified consultants. Having this pool is one of the barriers cities have been facing to moving forward with mandatory programs; there are not enough people trained to check plans for compliance with Build It Green or LEED standards. We support this phased approach as the most reasonable.

Recommendations

Staff recommends the City Council take the following actions:

1. Reorganize the Environmental Strategy Task Force as described above, including any current Task Force members that wish to continue.
2. Direct staff to implement the suggested sustainability practices for City Offices, wherever practical.
3. Direct staff to develop a phased green building program.

Attachments

1. Suggested Sustainability Practices for City Offices
2. ICLEI's Community Greenhouse Gas Inventory Methodology for Bay Area Local Governments
3. Community-Wide Greenhouse Gas Emissions Inventory for Lafayette – Emission Sources and Input Data
4. Draft Lafayette Community Greenhouse Gas Emissions in 2005

ATTACHMENT 1

City of Lafayette Memorandum

To: City Council

From: Zoe Merideth, Intern

Date: January 7, 2008

Subject: **Suggested Sustainability Practices for City Offices**

Summary

The City's Environmental Strategy, which was adopted in November 2006, calls for the adoption of more environmentally sustainable practices. One of the goals to have accomplished by the end of 2007 is to "Investigate and make recommendations to the City Council regarding the development and implementation of sustainable procurement practices for City supplies and materials."

Background and Discussion

Staff has been developing a list of sustainable practices. Staff researched other cities' procurement plans and asked Lafayette staff for input in developing the list. ABAG also has a green business program; many of the suggestions below are from this program. In addition to procurement practices, the sustainability suggestions extend to all parts of the City Offices' operations.

By implementing these strategies, the City will be able to reduce its operating costs. Over the last year, the City has, on average, spent $55 a month on its bottled water delivery service. Canceling this service would save the City about $660 annually. The City's current copying paper does not contain any recycled materials and costs $4.55 a ream. Paper containing 100% post consumer content is available for approximately 50 cents less. For a dollar less, the City can purchase paper containing 30% post consumer content. The suggestions for City Offices are as follows:

Paper:

- Increase the number of recycling bins available.
    - Possibly include recycling inserts into each employee trash can.
    - Have recycling/composting for products that have touched food.
- Ensure that the recycling really is recycled.
    - This could include taking turns taking out the recycling to the dumpsters.
- Set printers and copiers to duplex mode.
- Use the back side of used paper to print drafts and other internal documents.
- When possible, eliminate the use of hard copies and use electronic records instead.
- Format documents to make good use of space.
    - Set narrower margins.
    - Check spacing and fonts sizes.
- Reduce the number of paper towels used.
    - Possibly use terry cloth towels and rotate who washes them.
- Reduce the amount of packaging used in shipping.
    - Reuse packaging materials and boxes.
- Keep mailing lists up-to-date to avoid sending out extra mailings that will only be returned.

- Make sure only one copy of a publication is sent for the entire office to share.
    - Get off of junk mail lists.
- Track paper consumption and use.

Energy:
- Turn off lights that are not being used.
    - Turn off lights when leaving for lunch and at the end of the day.
- Use natural light when possible.
- Remove the middle light bulb from the overhead lights.
- Put sensors on lights to detect sunlight and/or movement.
- Make sure office equipment is set to energy saving modes.
- Turn off monitors when they are not in use.
    - Deactivate screen savers, which usually waste energy.
- Try to fix the HVAC system to not run constantly.
- Dress for the season.
- Make signs for the stairwell to discourage elevator use.

Office Supplies:
- Buy Energy Star and multi-function office equipment.
- Purchase paper with recycled content and preferably non-chlorine treated paper.
    - Buy locally whenever possible as well.
    - Look at the EPA Procurement Guidelines.
- Buy other office supplies with recycled content.
- Reuse file folders and put new labels on them.
- On Earth Day have a central area where employees can bring supplies they are not using for others to take.
- Refill toner and ink cartridges.
- Collect batteries for recycling.
- Use rechargeable batteries.
- For meetings and events using wheat or corn based plates and utensils.
- Buy regular plates for office kitchen for employees to use for lunch.

Water:
- Get rid of the delivered water.
    - Put a water dispenser in the fridge instead.
    - Get a water filter either one for the tap or the pitcher kind (like a Brita).
- At meetings provide pitchers of water of instead of individual bottles.
- Use cold water when possible.
- Do not leave the tap running.

Transportation:
- Encourage carpooling for off-site staff events and meetings.
- Buy hybrid vehicles.

Other:
- Encourage telecommuting.

Recommendation

Staff recommends that the Council accepts the suggested sustainability practices and directs they be implemented in City Offices where practical.

ICLEI Local Governments for Sustainability

Community Greenhouse Gas Inventory Methodology for Bay Area Local Governments

Prepared as part of Contra Costa County Inventory Workshop on February 6, 2008

Community-Scale Inventory

The community-scale inventory estimates the quantity of greenhouse gas (GHG) emissions for which the community as a whole is responsible for a specific analysis year. The community inventory is organized by sector—residential, commercial, industrial, transportation, and waste. When completed, the community inventory will include the quantities of electricity and fuels used in the residential, commercial, industrial, and transportation sectors, along with the amount of waste produced and landfilled in the analysis year, as well as the quantity of GHG emissions produced by each of these sectors. The data needed is typically available from **electric and gas utilities, planning and transportation agencies and solid waste management departments.**

Each local community has unique characteristics (e.g., population, housing types, transportation networks, industries, electricity fuel mix) that make its GHG inventory different from other cities or counties. The primary value of an emissions inventory is to enable the demonstration of progress over time. For this Community Inventory Workshop, all participating local governments will use data provided by common sources. However, each local government may choose to supplement this analysis with additional data sources of greenhouse gas emissions to analyze on their own.

Emission Sources that are Included

The community-wide analysis includes emissions from residential, commercial, and industrial sources, as well as transportation and waste management. All electricity and fuel use should be included as well as all waste generated from these sectors. Community-scale emissions analyses should utilize the geographic boundaries of the community.

Emission Sources that are Excluded

Local governments should endeavor to include all possible emission sources in their community-scale inventories. However, local governments will often choose to exclude emission sources that meet the following criteria:

- *Small and unimportant* – Emission sources can be excluded from the analysis (e.g. are "de minimis") if, when combined, the excluded emissions total less than 5% of the total of the emissions from the Community or Government Inventory.[1]
- *Prohibitively difficult to track with accuracy* – such as lawn care equipment, off-highway construction equipment, methane from wastewater and sewage sludge, non-combustion industrial emission sources.
- *Largely located outside the jurisdiction's boundaries* – such as intercity transportation fuel (i.e. air, rail, marine and intercity highway traffic).

[1] Note: an inventory should include at least 95% of the emissions released by the government and community as a whole. Therefore, if a large number of small emission sources occur within the jurisdiction, they cannot all be ignored.

ATTACHMENT 2

Finally, emissions from very large energy intensive industrial facilities (paper and steel mills, industrial chemical plants, petrochemical plants and refineries, metal smelters, large cement making operations) should be represented within the context of the community-scale emissions inventory results in an appropriate fashion, as (1) their emissions may be well documented in other inventory programs, (2) the purpose of a local government analysis is to account for the emissions the jurisdiction has the ability to influence, and (3) their inclusion could skew the results to the point of prohibiting the facilitation of intercity comparisons.

Base vs. Additional Emission Sources

Base Emission Sources are effectively required for reporting of community-scale emissions inventories. Any future comparative reporting of emissions across jurisdictions should include comparison of energy/fuel demand and emissions produced exclusively by these Base Emission Sources. Guidance on estimating emissions from these sources will be included in the ICLEI Local Government Emissions Analysis Protocol.

Additional Emission Sources should also be calculated and included to the extent possible. Guidance on estimating emissions from these sources will also be included in the Local Government Emissions Analysis Protocol. However, it is recognized that in some communities data on some of these emission sources will be unavailable or inappropriate to include within a community-scale emissions analysis. Thus any future comparative reporting should also enable appropriate comparison of total emissions with sufficient transparency of source components included.

Scopes

Scope 1 emission sources within the context of community-scale emissions analyses include all direct emissions generated during the analysis period within the community boundaries.

Scope 2 emission sources within the context of community-scale emissions analyses include all emissions generated during the analysis period outside the community's geographic boundaries but due to activity occurring inside the boundaries (e.g., emissions from power plants associated with electricity consumption).

Information Items within the context of community-scale emissions analyses include additional potentially policy-relevant emission data that does not fit within the above scope definitions. In some cases this might include lifecycle emissions estimates associated with up-stream manufacture or transport of fuels or materials.

General Data Requirements

Emission factors (also referred to as emission coefficients) and activity level data, typically framed as the amount of energy consumed or waste generated, are needed to calculate emissions resulting from that activity. Emission factors describe the quantity of a pollutant emitted for every unit of activity. For example, the emission factor for electricity purchased from PG&E in 2005 is 0.489 lbs. of CO_2/kwh of electricity delivered. ICLEI recommends converting all GHG emissions into carbon dioxide equivalent units, or CO_2e, per the international convention of using global warming potentials outlined in the IPCC's Second Assessment Report (SAR). However, this convention may change in the future as international consensus shifts to using the values identified in the third assessment report. See Appendix A for more information.

Residential, Commercial and Industrial Sectors

What is included in this data?

- CO_2e for all PG&E electricity that is consumed within your jurisdiction. The CO_2 emission factor has been certified by the California Climate Action Registry (CCAR) and accounts for transmission losses.
- CO_2, CH_4 and N_2O emissions for all natural gas that was delivered within your jurisdiction.
- Estimations of electricity purchased through Direct Access (DA) contracts at the county level based on data provided by the California Energy Commission. The amount of DA in a given community varies; however, 11.9% of electricity consumption in California was DA in 2005 according to the CPUC. http://www.cpuc.ca.gov/static/energy/electric/electric+markets/direct+access/00thru05.htm.

What is not included in the data we have provided?

- Exact emission factors for the electricity purchased through DA. There are numerous power producers throughout the state of California and in neighboring states that provide electricity to DA customers in San Mateo and Santa Clara Counties, with each power producer using different energy sources and technologies. Because the identity of individual DA customers and companies that they purchase electricity from is protected information, we have used the grid-average emission factor for California and Nevada to estimate emissions from DA customers.
- All electricity from a municipal utility.
- Fuel sources not delivered by PG&E. For example, wood, charcoal, propane, kerosene, diesel, heavy fuel oil, etc.
- PFCs, HFCs, SF_6. This data is likely to be prohibitively difficult to obtain.

Emission Factors and Calculation Method:

Emission Source	GHG	Emission Factor	Emission Factor Source
PG&E Electricity*	CO_2	0.489155 lbs/kwh	The certified CO_2 emission factor for delivered electricity is publicly available at http://www.climateregistry.org/CarrotDocs/19/2005/2005_PUP_Report_V2_Rev1_PGE_rev2_Dec_1.xls
	CO_2e	0.492859 lbs/kwh	PG&E
Default Direct Access Electricity*	CO_2	343.3 short tons/GWh	ICLEI/Tellus Institute (2005 Region 13 - Western Systems Coordinating Council/CNV Average Grid Electricity Coefficients)
	CH_4	0.035 short tons/GWh	
	N_20	0.027 short tons/GWh	
Natural Gas	CO_2	53.05 kg/MMBtu	PG&E/CCAR. Emission factors are derived from: California Energy Commission, Inventory of California Greenhouse Gas Emissions and Sinks: 1990-1999 (November 2002); and Energy Information Administration, Emissions of Greenhouse Gases in the United States 2000 (2001), Table B1, page 140.
	CH_4	0.0059 kg/MMBtu	CCAR. Emission factors are derived from: U.S. EPA, "Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2000" (2002), Table C-2, page C-2. EPA obtained original emission factors from the Intergovernmental Panel on Climate Change, Revised IPCC Guidelines for National Greenhouse Gas Inventories: Reference Manual (1996), Tables 1-15 through 1-19, pages 1.53-1.57.
	N_20	0.001 kg/MMbtu	

*These emission factors only apply for the year 2005.

Data Sources:

Electricity and Natural Gas Consumption: Pacific Gas and Electricity (PG&E)

Contact: Jasmin Ansar, Manager, Environmental Policy, PG&E, JxA2@pge.com, (415) 973-4570

Emission Factors: See above.

Transportation Sector

What is included in this data?

- All non-highway VMT is included in city data.
- State and Interstate highway VMT within each city.

What is not included in this data?

- Vehicle emissions related to sea ports and air ports.
- Rail transit emissions. However, BART's electricity consumption is embedded in the community electricity data.
- The emissions quantification method used for the transportation sector does not reflect the use of any fuels besides gasoline and diesel.
- PFCs, HFCs, SF_6. This data may be prohibitively difficult to obtain.

Emission Factors*:

County	CO_2 Rates (grams/mile)		CH_4 Rates (grams/mile)		N_2O Rates (grams/mile)		VMT Mix		CO_2 Rates- (grams/gallon)		Fuel Usage		Fuel Efficiency (miles/gallon)	
	Gas	Diesel	Gas	Diesel	Gas	Diesel	Gas	Diesel	Gas	Diesel	Gas	Diesel	Gas	Diesel
Contra Costa	470	1,271	0.061	0.022	0.070	0.050	95.2%	4.8%	8,630	9,994	89.4%	10.6%	18.4	7.9
Bay Area AQMD Average	463	1,389	0.063	0.030	0.070	0.050	94.9%	5.1%	8,607	10,091	87.8%	12.2%	18.6	7.3

*The values above only apply for the year 2005

Data Sources:

2005 Vehicle Miles Traveled (VMT) data by City and County: MTC- Metropolitan Transportation Commission. Based on the Highway Performance Monitoring System (HPMS). Data is reported in Daily Vehicle Miles Traveled. Annual VMT is calculated by multiplying the DVMT by 365 days, as the DVMT accounts for decreased traffic volumes on the weekends.
Contact: Benjamin Espinoza, Transportation Planner, MTC, BEspinosa@mtc.ca.gov

Emission Factors, VMT Mix, Fuel Usage and Fuel Efficiency: Bay Area Air Quality Management District (BAAQMD). CO_2, CH_4 and N_2O emission factors are generated using the EMFAC model. The basis for the estimates are CO_2 emission rates (grams/mile), which are based on engine testing at different speeds, and county-wide vehicle registration data obtained from DMV. Estimates are available for years 1970-2040. The model also provides estimates of criteria air pollutants, as well as methane emissions (CH_4). In addition, it produces an estimate of fuel usage, and fuel economy. County variations in emission factors are due to the use of county-specific vehicle usage, vehicle mix, vehicle speed and ambient temperatures. For more information on EMFAC2007, please refer to California Air Resources Board website: http://www.arb.ca.gov/msei/onroad/latest_version.htm
Contact: Ana Sandoval, Principal Environmental Planner, BAAQMD, ASandoval@baaqmd.gov

Waste Sector

What is included in this data?

1) Landfill Waste in Place
   - Total emissions (methane emissions) released from any landfills located in your jurisdiction in the baseline year
2) Lifetime Decomposition Associated with Waste Generated
   - Total emissions (methane emissions) from solid waste generated in your jurisdiction in the baseline year that was sent to landfills regardless of whether they are located within or outside of your jurisdiction's boundaries
   - Total emissions (methane emissions) from the Alternative Daily Cover (ADC) used in the landfills where the waste generated in your jurisdiction is disposed.

What is not included in this data?

- Any GHG emissions from fossil-based products (incineration or decomposition) are not included nor are GHG emissions from organic waste handling and decay because they are considered to be biogenic in origin.

Emission Factors and Calculation Method:

1) Total Emissions Generated from Landfill Waste in Place: Estimate using the EPA Landfill Gas Emissions Model (LandGEM). LandGEM is available online: http://www.epa.gov/ttn/catc/products.html. Also a version of LandGEM is available in ICLEI's CACP Software User's Manual: http://www.epa.gov/ttncatc1/dir1/landgem-v302-guide.pdf
2) Lifetime Decomposition Associated with Waste Generated: The methane emission factors used in the ICLEI CACP Software were derived from the EPA WARM model. For quantification of emissions only methane generation (or gross emissions) is taken into account. More information on the WARM Model is available at: http://epa.gov/climatechange/wycd/waste/calculators/Warm_home.html

Data Sources:

1) Landfill information and total landfill waste in place: Bay Area Air Quality Management District (BAAQMD).
   Contact: Ana Sandoval, Principal Environmental Planner, BAAQMD, ASandoval@baaqmd.gov
2) Waste Generated Tonnage: California Integrated Waste Management Board (CIWMB), California Solid Waste Statistics.
   Waste disposal and alternative daily cover (ADC) tonnage is reported by permitted facility operators and compiled by county/regional agency disposal reporting coordinators and published in the Disposal Reporting System (DRS) for every county/jurisdiction from 1999 to 2005 (as of September 2007).by the California Integrated Waste Management Board. http://www.ciwmb.ca.gov/LGCentral/DRS/Reports/JurDspFa.asp

Waste Characterization: CIWMB 2004 Statewide Waste Characterization Study. This state average waste characterization accounts for residential, commercial and self haul waste. http://www.ciwmb.ca.gov/Publications/default.asp?pubid=1097
Residential and Commercial Waste Characterization Studies are provided every five years by county/jurisdiction. The CIWMB does not compile the sector-specific tonnage of waste generated. Therefore, this characterization is only usable if every jurisdiction has the exact tonnage per sector. http://www.ciwmb.ca.gov/Profiles/Juris/Default.asp

CIWMB's waste categories correlate with the ICLEI CACP software categories according to the following guidelines:

- Paper Products includes all paper types.
- Plant Debris includes leaves and grass, prunings and trimmings, branches and stumps, and agricultural crop residues.

- Wood and Textiles includes lumber.
- Other category includes all inorganic material types reported: glass, metal, electronics, plastics, non organic C&D, and special/hazardous waste.

Landfill Gas Recovery Rate (or Methane Recovery Factor): *Solid Waste Disposal. Chapter 2. AP 42 Emission factors.* U.S. EPA 1998

Landfills in the San Francisco Bay Area are regulated under the EPA New Source Performance Standard regulations. The local implementation agency is the Bay Area Air Quality Management District. Onsite measurements should be reported to comply with the control emissions (Non Methane Organic Compounds). The recommended landfill gas recovery rate (or methane recovery factor) that landfills should apply for their uncontrolled emissions is provided by the EPA AP 42 Emission Factor Guidelines and it is from 60%-85%. ICLEI recommends using the minimum recommended rate being consistent with the 2006 IPCC Guidelines of acknowledging the uncertainties associated with the measurements.
http://www.epa.gov/ttn/chief/ap42/ch02/index.html

Appendix A

Global Warming Potentials and CO_2e

When reporting GHG emissions and reductions, the individual gases are typically converted to carbon dioxide equivalencies (CO_2e) in order to report a single number that captures the total amount of GHG being released (or avoided).

Carbon dioxide equivalent (CO_2 e) is a commonly used unit that allows amounts of greenhouse gases of different strengths to be added together based on each gas's relative impact on climate change. CO_2 e is expresses in terms of the amount of carbon dioxide it would take to produce the same impact on global climate change. For example, nitrous oxide is 310 times more potent than carbon dioxide as a greenhouse gas. Therefore, one ton of N_2O is equal to 310 tons CO_2e. This conversion factor is known as the gas's "global warming potential." The global warming potential is calculated based on a 100 year time frame, taking into consideration both impact and the length of time the gas remains in the atmosphere (i.e. a more potent greenhouse gas that is removed from the atmosphere in 10 years could have a lower global warming potential than a weaker gas that remains in the atmosphere for 50 years).

Relative Global Warming Potentials from the IPCC's Second (SAR) and Third (TAR) Assessment Reports

Gas	SAR	TAR
Carbon Dioxide	1	1
Methane	21	23
Nitrous Oxide	310	296
HFC-23	11,700	12,000
HFC-125	2,800	3,400
HFC-134a	1,300	1,300
HFC-143a	3,800	4,300
HFC-152a	140	120
HFC-227ea	2,900	3,500
HFC-236fa	6,300	9,400
Perfluoromethane (CF4)	6,500	5,700
Perfluoroethane (C2F6)	9,200	11,900
Sulfur Hexafluoride (SF6)	23,900	22,200

Appendix B

METROPOLITAN
TRANSPORTATION
COMMISSION

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Memorandum

TO: Local Governments in the Bay Area DATE: November 28, 2007

FR: Benjamin Espinosa

RE: Daily Vehicle Miles of Travel

This memo provides a summary of the daily vehicle miles of travel (DVMT) calculations performed for the counties of San Mateo and Santa Clara. The information comes from the Highway Performance Monitoring System (HPMS) inventory. The HPMS is a Federal study that provides information on travel, use and condition of the Nation's roads and highways. This information is used to report the condition of the highway system to Congress, to measure changes in the highway system performance, to monitor air quality trends and to apportion Federal-aid funds.

In California, Caltrans is responsible for collecting the HPMS data, validating the records and submitting the information to FHWA. Caltrans collects the information for roads on the State system and relies on the metropolitan planning organizations MPO's or Caltrans district offices (in areas with no MPO) to report the information on roads off the State system. The MPO's work in partnership with the cities, towns and counties under their jurisdiction to update the HPMS data items in their area.

The HPMS breaks up the entire road system into sections. Information regarding the length, ownership, traffic volumes, and pavement condition, among others, is provided for each section. Sections are broken down based on their urban/rural designation and by their functional classification. The urban/rural designation comes from the Census urban boundaries. The functional classification is based on the service the road provides. The primary categories are:

1. Principal Arterials - This system serves the major centers of activity of a metropolitan area, the highest traffic volume corridors, and the longest trips. Almost all fully and partially controlled access facilities will be part of this functional system.

2. Minor Arterials - A street or highway designed to carry traffic and provide access to abutting property. The primary purpose of the minor arterial is to serve moderate length neighborhood trips and to channel traffic from collectors and local streets to principal arterials or expressways. Cross traffic is accommodated at at-grade intersections.

3. Collectors - The collector street system provides both land access service and traffic circulation within residential neighborhoods, commercial and industrial areas. The primary purpose of the collector is to serve short length neighborhood trips and to channel traffic from local streets and abutting properties to minor arterials and principal arterials.

4. Local Streets - It serves primarily to provide direct access to abutting land and access to the higher order systems.

The Principal Arterials are further stratified in urban areas into the following categories:

1. Interstates - Consists of all presently designated routes of the Interstate System.

2. Freeways & Expressways - A fully access-controlled or a partially access controlled highway designed for high-speed travel with the sole purpose of facilitating non-stop traffic flow without obstruction or minimal interference from cross traffic.

3. Other Principal Arterials – A partially access controlled road with cross traffic. Cross traffic is accommodated at at-grade signalized intersections for streets with high traffic levels, or at at-grade intersections without signals for streets with moderate or low traffic levels.

The rural areas don't have the Freeways & Expressway designation. Collectors are further subclassified in rural areas into the following categories:

1. Major Collectors – These roads provide service to any county seat not on an arterial route and to the larger towns not directly served by the higher systems. They link traffic generators with nearby larger towns or cities, or with routes of higher classification.

2. Minor Collectors – These roads collect traffic from local roads and bring all developed areas within a reasonable distance of a collector road. They also provide service to the remaining smaller communities.

Travel data is reported as daily vehicle-miles of travel (DVMT) on the HPMS. This is a measurement of the total miles traveled by all vehicles in a specified area during a given period of time. One vehicle traveling one mile constitutes one vehicle mile regardless of its size or the number of passengers. For sections classified as Principal Arterial, Minor Arterials and Collectors, the DVMT is calculated by multiplying the average annual daily traffic (AADT) and the corresponding section length of the roadway entered into the HPMS database. For local roads, an estimate is provided by Caltrans based on a gas consumption model.

The fact that the ownership of the road segment is coded on the HPMS inventory makes it easy to extract the DVMT for each city and county using statistical software. It is not that straightforward with roads under State jurisdiction. HPMS sections on roads owned by the state are not split along cities or county boundaries. This means that a section on a State road might cross various jurisdictions.

For this project, each segment of the state highways was visually examined on a map to identify the jurisdictions it passes through. A portion of the total DVMT for the road segment was allocated to each city and county the section traverses. For example, there is an HPMS section of highway 101 that runs from the San Mateo/Santa Clara County line to the highway 84/ Woodside Expressway. This section crosses the city of East Palo Alto, Menlo Park and Redwood City. The total DVMT for this section is 1050. In this case 350 was allocated to each of the 3 cities.

You can find more information about the HPMS process in the following links:

http://www.dot.ca.gov/hq/tsip/hpms/index.php

http://www.fhwa.dot.gov////////policy/ohpi/hpms/index.htm

ATTACHMENT 3

Community-Wide Greenhouse Gas Emissions Inventory			
Jurisdiction:	Lafayette		
County:	Contra Costa		
Baseline Year:	2005		
Sector	**Emission Source**	**Input Data** Units	Values
Residential	Electricity Consumption	kWh	85,364,463
	Natural Gas Consumption	Therms	6,716,863
Commercial	Electricity Consumption	kWh	42,046,505
	Natural Gas Consumption	Therms	1,287,051
Industrial	Electricity Consumption	kWh	5,289,280
	Natural Gas Consumption	Therms	0
	Industrial Electricity (Fails 15/15)[1]		0
	Industrial Natural Gas (Fails 15/15)		0
Direct Access (see below for DA emission factor)	Electricity Direct Access (from PG&E)	kWh	zzzzz
	% DA County Estimate for Residential	%	0.00%
	% DA County Estimate for Commercial and Industrial [4]	%	12.07%
Transportation	Gasoline and Diesel Consumption (VMT)[2]	Annual VMT (95.2% Gasoline 4.8% Diesel)	134,473,300
	State Highway VMT [3]	Annual VMT (95.2% Gasoline 4.8% Diesel)	239,203,105
Waste	Total Landfill Waste (See Waste Table)	Metric Tons	25,554
	Total Alternative Daily Cover (See Waste Table)	Metric Tons	1,215
	% ADC Green Material	%	84.76%
	Landfill Waste in Place	MetricTons	0
	Year Opened / closed		0

15,378,417

Notes

[1] Requires that any aggregated information provided by the utilities must be made up of at least 15 customers, and a customer's load must be less than 15% of an assigned category

[2] From 2005 Highway Performance Monitoring system (HPMS) Report. Does not include State Highway VMT

[3] From MTC

[4] From California Energy Commission, Andrea Gough

Additional Information

Emission Factor (2005)		Year	lbsCO2e/ kWh	Source
Utility	PG&E	2005	0.492859	PG&E
DA	CA-NV Grid Average	2005	0.686625	ICLEI CACP

Community- Wide Greenhouse Gas Emissions Inventory
Waste Sector

*Metric tons

Jurisdiction:	Lafayette
Baseline year:	2005

**Solid waste composition for Total Waste	
Paper Products	20.50%
Food Waste	12%
Plant Debris	9.30%
Wood/Textiles	19.20%
All Other Waste	39%

Solid Waste Composition for ADC	
Paper Products	0%
Food Waste	0%
Plant Debris	84.76%
Wood/Textiles	0%
All Other Waste	15.24%

Landfill	Methane Recovery Factor	Waste Category	Total Tonnage/year*	Composition	%
VASCO ROAD SANITARY LANDFILL (Alameda)	60%	Solid Waste	318	**	
		Alternative Daily Cover (ADC)	0		
ACME LANDFILL (Contra Costa)	60%	Solid Waste	323	**	
		Alternative Daily Cover (ADC)	117	green material	100
KELLER CANYON LANDFILL (Contra Costa)	60%	Solid Waste	23,523	**	
		Alternative Daily Cover (ADC)	906	green material	100
POTRERO HILLS LANDFILL (Solano)	60%	Solid Waste	948	**	
		Alternative Daily Cover (ADC)	5	green material	2
All Other Landfills	60%	Solid Waste	760	**	
		Alternative Daily Cover (ADC)	4	All Other Waste	100
		Total Solid Waste Tonnage	**25,554**		
		Total ADC Tonnage	**1,215**		

Sources:

California Integrated Waste Management Board
Waste Disposed
http://www.ciwmb.ca.gov/LGCentral/DRS/Reports/JurDspFa.asp

RATE DATA ANALYSIS: DR3712 GAS AND ELECTRIC GHG SUMMARY FOR INC CITIES AND UNINC PORTIONS OF CONTRA COSTA COUNTY

Electricity Consumption

CITY	YEAR	CATEGORY	RES ELEC	RES ELEC	RES ELEC	RES ELEC	COM ELEC	COM ELEC	COM ELEC	COM ELEC	IND ELEC	IND ELEC	IND ELEC	IND ELEC	IND ELEC	DA KWH
			AVG(KWH)	USE(KWH)	GHG(tons)	CLIM(lbs)	AVG(KWH)	USE(KWH)	GHG(tons)	CLIM(lbs)	AVG(KWH)	USE(KWH)	GHG(tons)	CLIM(lbs)	1515	
LAFAYETTE	2005	NONGOVENT	745	85364463	20872		2851	36925243	9028							ZZZZZ
LAFAYETTE	2005	(3) COUNTY					6732	83480	20							
LAFAYETTE	2005	(4) CITY					677	521252	127							
LAFAYETTE	2005	(5) DISTRICT					7916	4516530	1104		219199	5289280	1293			
		Total		85364463				42046505				5289280			0	0

Natural Gas Comsumption

CITY	YEAR	CATEGORY	RES GAS	RES GAS	RES GAS	RES GAS	COM GAS	COM GAS	COM GAS	COM GAS	IND GAS	IND GAS	IND GAS	IND GAS	IND GAS
			AVG(THM)	USE(THM)	GHG(tons)	CLIM(lbs)	AVG(THM)	USE(THM)	GHG(tons)	CLIM(lbs)	AVG(THM)	USE(THM)	GHG(tons)	CLIM(lbs)	1515
LAFAYETTE	2005	NONGOVENT	63	6716863	39294		187	1144524	6695						
LAFAYETTE	2005	(3) COUNTY					47	568	3						
LAFAYETTE	2005	(4) CITY					831	9967	58						
LAFAYETTE	2005	(5) DISTRICT					783	131992	772						
		Total		6716863				1287051					0		0

REFERENCE KEY

Definition of terms :

RES = Residential, **COM** = Commercial, **IND** = Industrial

AVG = Usage divided by number (#) of customer months in the year

KWH Usage = Kilowatt Hours of Electricity Usage

THM Usage = Therms of Natural Gas Usage

GHG (Tons) = Greenhouse Gas (GHG) Emissions (Tons of CO2) from Electricity or Natural Gas Usage (**)

CLIM (lbs) = Emission Reductions from Enrolled ClimateSmart customers (lbs of CO2) for Electricity or Natural Gas

DA KWH = shows if DA is present, takes the value ZZZZZ if amount cannot be revealed due to confidentiality concerns (15/15 rule)

IND = FAIL, flags that shows that industrial usage is rolled (does not apply for DA kwh) into Commercial usage since 15/15 rule prohibits revelation of value.

Greenhouse Gas Emission Rates for Electric :

- 2003: KWh x (**0.620** / 2000) Tons/kWh
- 2004: KWh x (**0.566** / 2000) Tons/kWh
- 2005: KWh x (**0.489** / 2000) Tons/kWh
- 2006: KWh x (**0.459** / 2000) Tons/kWh
- ClimateSmart Electric Emissions Rate : 0.524 lbs/kWh

ATTACHMENT 4

DRAFT

Lafayette

Community Greenhouse Gas Emissions in 2005

Summary Report

	Equiv CO_2 (tons)	Equiv CO_2 (%)	Energy (MMBtu)
Residential	41,498	13.1	671,686
Commercial	30,822	9.7	400,914
Industrial	2,535	0.8	24,387
Transportation	233,241	73.6	2,720,513
Waste	8,892	2.8	
Total	316,989	100.0	3,817,500

DRAFT

Community Greenhouse Gas Emissions in 2005
Detailed Report

	Equiv CO_2 (tons)	Equiv CO_2 (%)	Energy (MMBtu)
Residential			
Lafayette, CA			
PG&E Residential Natural Gas			
Natural Gas	41,498	13.1	671,686
Subtotal PG&E Residential Natural Gas	41,498	13.1	671,686
Subtotal Residential	41,498	13.1	671,686
Commercial			
Lafayette, CA			
PG&E Comm Natual Gas			
Natural Gas	7,952	2.5	128,705
Subtotal PG&E Comm Natual Gas	7,952	2.5	128,705
PG&E Commercial Electricity			
Electricity	14,919	4.7	143,503
Subtotal PG&E Commercial Electricity	14,919	4.7	143,503
PG&E Commercial Natural Gas			
Natural Gas	7,952	2.5	128,705
Subtotal PG&E Commercial Natural Gas	7,952	2.5	128,705
Subtotal Commercial	30,822	9.7	400,914
Industrial			
Lafayette, CA			
Direct Access Electricity			
Electricity	659	0.2	6,335
Subtotal Direct Access Electricity	659	0.2	6,335
PG&E Industrial Electricity			
Electricity	1,877	0.6	18,052
Subtotal PG&E Industrial Electricity	1,877	0.6	18,052
Subtotal Industrial	2,535	0.8	24,387

DRAFT

Community Greenhouse Gas Emissions in 2005
Detailed Report

	Equiv CO_2 (tons)	Equiv CO_2 (%)	Energy (MMBtu)	
Transportation				
Lafayette, CA				
Highway VMT				
Gasoline	132,277	41.7	1,545,389	
Diesel	17,028	5.4	196,104	
Subtotal Highway VMT	149,305	47.1	1,741,494	
Local VMT				
Gasoline	74,363	23.5	868,775	
Diesel	9,573	3.0	110,244	
Subtotal Local VMT	83,935	26.5	979,019	
Subtotal Transportation	233,241	73.6	2,720,513	
Waste				
Lafayette, CA				
Total Alternative Daily Cover				*Disposal Method - Managed Landfill*
Plant Debris	-183	-0.1		
Subtotal Total Alternative Daily Cover	-183	-0.1		
Total Solid Waste				*Disposal Method - Managed Landfill*
Paper Products	6,989	2.2		
Food Waste	3,818	1.2		
Plant Debris	-423	-0.1		
Wood/Textiles	-1,309	-0.4		
Subtotal Total Solid Waste	9,076	2.9		
Subtotal Waste	8,892	2.8		
Total	316,989	100.0	3,817,500	